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IBM CORPORATION
ROCHESTER IP LAW DEPT. 917
3605 HIGHWAY 52 NORTH
ROCHESTER, MN 55901-7829

EXAMINER	
LIN, SHEW FEN	

ART UNIT	PAPER NUMBER
2166	

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/600,063	OLSTAD ET AL.	
	Examiner	Art Unit	
	Shew-Fen Lin	2166	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

a. This action is responsive to application filed on 6/20/2003.

b. Claims 1-32 are pending. Claims 1, 5, 20, and 31 are independent claims.

Claim Rejections – 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-19 and 31-32 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

MPEP 2106 IV. B.2. (b)

A claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under 35 U.S.C. 101. Schrader, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan (discussed in i) below), or (B) be limited to a practical application within the technological arts.

Claims 1-19 in view of the above-cited MPEP section are not statutory because they merely recite steps that can be performed by a person with pen and paper. The use of a computer or a data processor has not been indicated being used to perform the steps. The language of the claim raises a question as to whether the claim is directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result a practical application

producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101 nor is there a transformation of something physical to another state or thing.

As to claims 31-32, the claims are directed to "program product". However, claim 31 specifies "program code" is included in "signal-bearing media", which is a non-tangible medium. Claims 31-32 are therefore non-statutory subject matter as being non-tangible embodied.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 31-32 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In claims 31 and 32, "signal bearing medium", "recordable medium", and "transmission medium" are not defined in the disclosure in a way that it is clear to the person skilled in the art.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9, 13-18, 20-29, and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tavares et al. (US Patent, 5,307,487, hereinafter referred as Tavares) in view of Gupta et al. (US Patent, 5,710,881, hereinafter referred as Gupta).

As to claim 1, Tavares discloses a method of accessing a data structure (read/write data, column 2, lines 15-16), the method comprising: initializing a flux count associated with a data structure to an even value; in response to a request to modify the data structure, sequentially and

in order: incrementing the flux count to an odd value (increment counter before update, Figure 6, column 2, lines 36-38, column 4, lines 15-18); acquiring an exclusive serialization mechanism for the data structure; modifying the data structure (update data by writer, Figure 6, column 4, lines 18-19); releasing the exclusive serialization mechanism; and incrementing the flux count to an even value (increment counter by 1, Figure 6, column 4, lines 19-23); and in response to a request to access data from the data structure (reader access data, Figure 7, column 4, lines 24-25), sequentially and in order: copying the flux count to obtain a copy of the flux count (read the counter before access data, Figure 7, column 4, lines 32-33); copying the requested data from the data structure to obtain a copy of the requested data (read data, Figure 7, column 4, line 34); and determining that the copy of the requested data is valid if the copy of the flux count is an even value and the copy of the flux count is still equal to the flux count after the copy of the requested data is obtained (compare to see if the counter before/after access data is the same, Figure 7, column 4, lines 40-43, lines 47-49).

Tavares discloses the elements of claim 1 as noted above but does not explicitly disclose initializing a flux count associated with a data structure to an even; acquiring an exclusive serialization mechanism for the data structure and releasing the exclusive serialization mechanism after data modification is finished.

Gupta discloses setting the counter (lock flag) to zero (even number) as an initial unlock value, and increment lock value to one before modifying data and allowing process to obtain exclusive lock (exclusive serialization) during data modification, then release lock after data modification is finished (Figure 4, column 11, lines 31-36, lines 39-53, column 12, lines 1-4).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares's disclosure to include exclusive lock during data modification as taught by Gupta for the purpose of preventing data collision during multiple data access (column 2, lines 8-16, Gupta). The skilled artisan would have been motivated to improve the invention of Tavares per the above to maintain the data consistency in a multithreaded environment (column 2, lines 17-19, Gupta).

As to claim 2, Tavares discloses the elements of claim1 as noted above and further discloses in response to the request to access data from the data structure determining that the copy of the requested data is not valid if either the copy of the flux count is an odd value or the copy of the flux count is not equal to the flux count after the copy of the requested data is obtained (unequal in counter indicates a collision in data, column 4, lines 43-47).

As to claim 3, Tavares discloses the elements of claim 2 as noted above and further discloses in response to determining that the copy of the requested data is not valid, acquiring a shared serialization mechanism for the data structure and obtaining a copy of the requested data while the shared serialization mechanism is acquired (collisions can be processed by priority, serializes access, column 1, lines 45-46, lines 60-62, column 4, lines 58-61).

As to claim 4, Tavares discloses the elements of claim2 as noted above and further discloses in response to determining that the copy of the requested data is not valid, repeating the copying of the flux count and the copying of the requested data from the data structure until the

copy of the flux count is an even value and the copy of the flux count is still equal to the flux count (re-invoking the process of accessing data, column 1, lines 49-59, column 4, lines 58-61).

As to claims 5, 20, and 31, Tavares discloses a system with methods /means / system of accessing a data structure (read/write data, column 2, lines 15-16), the method comprising: in connection with modifying the data structure: prior to modifying the data structure, updating a flux indicator associated with the data structure from a first state to a second state to indicate that the data structure is in the process of being modified (increment counter before update, Figure 6, column 2, lines 36-38, column 4, lines 15-18); and after modifying the data structure, updating the flux indicator to a third state to indicate that the data structure is no longer in the process of being modified (increment counter by 1, Figure 6, column 4, lines 19-23), wherein the third state is different from each of the first and second states; and in connection with accessing data from the data structure: obtaining a first copy of the flux indicator in connection with obtaining a copy of data from the data structure (increment counter by 1, Figure 6, column 4, lines 19-23); obtaining a second copy of the flux indicator after obtaining the copy of the data from the data structure (column 4, lines 40-43); and determining that the copy of the data from the data structure is valid if the first copy of the flux indicator does not indicate that the data structure is in the progress of being modified and if the first and second copies of the flux indicator have the same state (column 4, lines 32-34, lines 47-49).

Tavares discloses the elements of claim 5 as noted above but does not explicitly disclose using one counter to decide first, second, and third states.

Gupta discloses using one counter (lock flag) to decide state of data before/after data modification (Figure 4, column 11, lines 30-53).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares's disclosure to combine two counters into one and use increment values as the states of data as taught by Gupta to provide an improved access of a database (column 2, lines 27-32, Tavares). The skilled artisan would have been motivated to improve the invention of Tavares per the above to maintain the data consistency in a multithreaded environment (column 2, lines 17-19, Gupta).

As to claims 6 and 21, Tavares discloses the elements of claim 5 as noted above and further discloses determining that the copy of the data from the data structure is valid includes determining if the count values for the first and second copies of the flux indicator are equal (column 4, lines 43-47, Tavares).

Tavares discloses the elements of claim 6 as noted above but does not explicitly disclose wherein the flux indicator includes a count value capable of being set to a value selected from a set of values to indicate that the data structure is not in the progress of being modified, wherein the first state of the flux indicator includes a first count value in the set of values, wherein updating the flux indicator to the third state includes updating the count value to a second value in the set of values that is different from the first value (combine two counters as one, start with zero, increment 1 prior to update (odd number 1), increment 1 again at the completion of update, column 2, lines 27-46, Tavares, the first value is 0 and the second value is 2, and so on), and wherein.

Gupta discloses setting the counter (lock flag) to zero (even number) for an unlock state and increment counter before modifying data (Figure 4, column 11, lines 31-36, lines 39-53, column 12, lines 1-4).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares's disclosure to include zero bit as an unlock state and one bit as lock state as taught by Gupta for the purpose of preventing data collision during multiple data access (column 2, lines 8-16, Gupta). The combination of Tavares and Gupta's disclosure will include two sets of counter values (even, odd) in the counter that could be used to identify if the data is in the progress of being modified (bit 1) or not (bit 0). The skilled artisan would have been motivated to improve the invention of Tavares per the above to maintain the data consistency in a multithreaded environment (column 2, lines 17-19, Gupta).

As to claims 7, 8, and 22, Tavares discloses the elements of claim 5 as noted above but does not explicitly disclose wherein the count value is further capable of being set to a value selected from a second set of values to indicate that the data structure is in the progress of being modified, wherein the second state of the flux indicator includes a first count value in the second set of values, and wherein determining that the copy of the data from the data structure is valid includes determining if the count value is set to a value from the second set of values.

Gupta discloses setting the counter (lock flag) to zero (even number) for an unlock state and increment counter before modifying data (Figure 4, column 11, lines 31-36, lines 39-53, column 12, lines 1-4).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares's disclosure to include zero bit as an unlock state and one bit as lock state as taught by Gupta for the purpose of preventing data collision during multiple data access (column 2, lines 8-16, Gupta). The combination of Tavares and Gupta's disclosure will include two sets of counter values (even, odd) in the counter that could be used to identify if the data is in the progress of being modified (bit 1) or not (bit 0). The skilled artisan would have been motivated to improve the invention of Tavares per the above to maintain the data consistency in a multithreaded environment (column 2, lines 17-19, Gupta).

As to claims 9 and 23, Tavares discloses the elements of claim 5 as noted above but does not explicitly disclose wherein the flux indicator further includes an in flux flag, wherein updating the flux indicator from the first state to the second state includes setting the in flux flag, wherein updating the flux indicator to the third state includes resetting the in flux flag, and wherein determining that the copy of the data from the data structure is valid includes determining if the in flux flag for the first copy of the flux indicator is set.

Gupta discloses lock flag is set at the request (request to update data) and reset when request is complete (update complete) (column 5, lines 10-16, column 11, lines 6-10).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares's disclosure to set/reset flag as lock state as taught by Gupta for the purpose of preventing data collision during multiple data access (column 2, lines 8-16, Gupta). The skilled artisan would have been motivated to improve the invention of Tavares per the above to maintain the data consistency in a multithreaded environment (column 2, lines 17-19, Gupta).

As to claims 13 and 24, Tavares discloses the elements of claim 5 as noted above and further discloses wherein determining that the copy of the data from the data structure is valid includes determining if the count values for the first and second copies of the flux indicator are equal and determining if the first copy of the flux indicator is set to an even count value (column 4, lines 43-47, Tavares)

Tavares discloses the elements of claim 13 as noted above but does not explicitly disclose wherein the flux indicator includes a count value, wherein the first state of the flux indicator includes an even count value, wherein updating the flux indicator from the first state to the second state includes incrementing the flux indicator to an odd count value, wherein updating the flux indicator to the third state includes incrementing the flux indicator to an even count value.

Gupta discloses setting the counter (lock flag) to zero (even number) for an unlock state and increment counter before modifying data (Figure 4, column 11, lines 31-36, lines 39-53, column 12, lines 1-4).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares's disclosure to include zero bit as an unlock state and one bit as lock state as taught by Gupta for the purpose of preventing data collision during multiple data access (column 2, lines 8-16, Gupta). The combination of Tavares and Gupta's disclosure will include two sets of counter values (even, odd) in the counter that could be used to identify if the data is in the progress of being modified (bit 1) or not (bit 0). The first state will be even number (starting from 0), increment by one to second state becomes odd number, and final increment one when data updating finish becomes next even number. The skilled artisan would have been

motivated to improve the invention of Tavares per the above to maintain the data consistency in a multithreaded environment (column 2, lines 17-19, Gupta).

As to claims 14 and 25, Tavares discloses the elements of claim 5 as noted above and further discloses wherein accessing the data from the data structure is performed without acquiring a serialization mechanism (data can be accessed anytime without Lock/unlock, P/V primitives, column 2, lines 27-32).

As to claims 15 and 26, Tavares discloses the elements of claim 5 as noted above and further discloses wherein accessing the data from the data structure further comprises accessing the data from the data structure after acquiring a shared serialization mechanism in response to determining that the copy of the data from the data structure is not valid (collisions can be processed by priority, serializes access, column 1, lines 45-46, lines 60-62, column 4, lines 58-61).

As to claims 16 and 27, Tavares discloses the elements of claim 5 as noted above and further discloses wherein accessing the data from the data structure further comprises determining that the copy of the data from the data structure is not valid, and in response thereto, repeatedly obtaining of the first copy of the flux indicator, obtaining the copy of data from the data structure, and obtaining the second copy of the flux indicator until the first copy of the flux indicator does not indicate that the data structure is in the progress of being modified and the first

and second copies of the flux indicator have the same state (re-invoking the process of accessing data, column 1, lines 49-59, column 4, lines 58-61).

As to claims 17 and 28, Tavares discloses the elements of claim 5 as noted above and further discloses wherein the data from the data structure includes a plurality of fields, wherein obtaining the first copy of the flux indicator in connection with obtaining the copy of the data from the data structure includes obtaining the first copy of the flux indicator in connection with obtaining copies of the plurality of fields, and wherein determining that the copy of the data from the data structure is valid includes determining that the copies of the plurality of fields are valid based upon the flux indicator (multiple database can be used, column 4, lines 8-15).

As to claims 18 and 29, Tavares discloses the elements of claim 5 as noted above but does not disclose wherein modifying the data structure further includes, after updating the flux indicator from the first state to the second state and before updating the flux indicator to the third state, acquiring an exclusive serialization mechanism for the data structure, thereafter modifying the data structure, a thereafter releasing the exclusive serialization mechanism

Gupta discloses setting the counter (lock flag) to zero (even number) as an initial unlock value, and increment lock value to one before modifying data and allowing process to obtain exclusive lock (exclusive serialization) during data modification, then release lock after data modification is finished (Figure 4, column 11, lines 31-36, lines 39-53, column 12, lines 1-4).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares's disclosure to include exclusive lock during data modification as

taught by Gupta for the purpose of preventing data collision during multiple data access (column 2, lines 8-16, Gupta). The skilled artisan would have been motivated to improve the invention of Tavares per the above to maintain the data consistency in a multithreaded environment (column 2, lines 17-19, Gupta).

As to claim 32, Tavares discloses the elements of claim 5 as noted above but does not explicitly disclose wherein the signal bearing medium includes at least one of a recordable medium and a transmission medium.

Gupta discloses computer system with memory, processor, and communication media (column 6, lines 13-22).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares's disclosure to include computer system as taught by Gupta. The skilled artisan would have been motivated to improve the invention of Tavares per the above to use computer for processing program code (column 6, lines 23-33, Gupta).

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tavares in view of Gupta and further in view of Novak et al. (US Patent, 6,393,419, hereinafter referred as Novak).

As to claims 10 and 12, Tavares and Gupta (hereinafter referred as Tavares-Gupta) disclose the elements of claim 5 as noted above but do not disclose wherein the first set of values

is selected from the group consisting of a monotonic sequence, a prime number sequence, and a Fibonacci sequence.

Novak discloses using a change counter value (CCV) to track the modification of the data records and stating that CCV can be any value, number, time, character,..(column 3, lines 29-38, column 5, lines 6-14).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares-Gupta's disclosure to use different sequence of number as taught by Novak for the purpose of providing a mechanism for tracking the modification status of data (column 5, lines 4-6, Novak). The skilled artisan would have been motivated to improve the invention of Tavares-Gupta per the above to use different sequence of number for maintaining data consistency.

As to claim 11, Tavares-Gupta discloses the elements of claim 5 as noted above but do not disclose wherein updating the flux indicator to the third state includes storing a current clock value.

Novak discloses using a change counter value (CCV) to track the modification of the data records and stating that CCV can be any value, number, time, character,..(column 3, lines 29-38, column 5, lines 6-14).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares-Gupta's disclosure to use time-stamp as taught by Novak for the purpose of providing a mechanism for tracking the modification status of data (column 5, lines 4-

6, Novak). The skilled artisan would have been motivated to improve the invention of Tavares-Gupta per the above to use time-stamp for maintaining data consistency.

Claims 19 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tavares in view of Gupta and further in view of Han et al. (US Publish 2003/0120669, hereinafter referred as Han).

As to claims 19 and 30, Tavares-Gupta discloses the elements of claim 5 as noted above and further discloses but does not disclose wherein the data structure comprises a journaled object, and wherein the data in the data structure includes an indication of whether the journaled object is in a standby mode.

Han discloses journaled object in a standby mode (Figure 1, paragraph [0008], lines 8-9).

It would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify Tavares-Gupta's disclosure to include journaled object as data structure as taught by Han for the purpose of providing indication of whether the object is in standby mode (Figures 1 and 5, paragraph [0030], Han). The skilled artisan would have been motivated to improve the invention of Tavares-Gupta per the above to maintain data consistency for object in a standby mode.

Related Prior Arts

The following list of prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Scoredos, Eric C., US 20040249812 A1, "Method and program product for reducing database walk frequency while repetitively accessing a firewall connection and rule database", (...A database operable in a multithreaded environment has a database update code. Each thread accessing the database obtains lock prior to alters database structure. Before releasing lock, the thread copies the database update code and a current record pointer into memory locations private to the thread. A thread requires a second access to a record of the database, it obtains lock. The thread then compares its copy of the update code to the database update code, if they are different the thread must re-walk the database to locate the record since database structure has changed since the thread first accessed the database).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shew-Fen Lin whose telephone number is 571-272-2672. The examiner can normally be reached on 8:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on 571-272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit 2166
January 6, 2006

Shew-Fen Lin
Patent Examiner

MOHAMMAD ALI
PRIMARY EXAMINER